

REMARKS

Claims 11, 38, 39 and 41 have been amended. Claims 11-14, 17-20, 22-24, 38, 39 and 41 are pending and under consideration. No new matter is presented in this Amendment. Claims 11, 38, 39 and 41 are the independent claims.

REJECTIONS UNDER 35 U.S.C. §103:

Claims 11-14, 17-20, 24 and 39 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kweon et al. (U.S. Patent 6,183,911) in view of Gao et al. (U.S. Publication 2002/0127175) in view of JP 11-097027.

Regarding the rejection of independent claim 11, it is noted that claim 11, as amended, recites a method of preparing a positive active material for a rechargeable lithium battery comprising: coating at least one lithiated compound with an organic solution of coating material source, the organic solution excluding water and prepared by adding a coating material source to an organic solvent forming a mixture, to produce a coated lithiated compound; and drying the coated lithiated compound at a temperature between 60°C to 100°C forming a surface treatment layer on the coated lithiated compound without heat-treating the dried coated lithiated compound, preparing the positive active material.

The Office Action relies on Kweon for some of the teachings of independent claim 11. In particular, the Office Action states that the positive active material is formed by a process of dissolving vanadium pentoxide (V_2O_5) in an organic solution, coating a lithiated compound with the (V_2O_5) solution, and drying the coated lithiated compound thereby forming the positive active material, and cites column 2, lines 35-65 of Kweon for such teachings.

Applicants respectfully assert that Kweon neither teaches nor suggests such novel features for at least the following reasons.

Kweon discloses preparing a vanadium pentoxide (V_2O_5) solution by dissolving 1 g of vanadium pentoxide powder in 100 g of distilled water. Then mixing 50 ml of vanadium pentoxide solution with 100 g of $LiMn_2O_4$ powder such that an overall surface of the power becomes sufficiently wet by the solution, and drying the mixture. Thereafter, Kweon discloses that the dried mixture is heat-treated to at about 600°C for about 10 hours under a dry air atmosphere to thereby prepare a vanadium pentoxide-coated active material (column 2, lines

35-65 and column 3, Example 1, lines 15-23). In other words, the positive active material is not formed until the coated lithiated compound is heat-treated, see Examples 2-4 and Comparative Examples 1 and 2 of Kweon which also disclose drying the mixture and thereafter heat-treating the mixture to obtain the positive active material (column 3, lines 35-37, 49-51, column 4, lines 7-9 and 16-17). In other words, the heat-treatment at a temperature ranging from 100°C to 1000°C cited in column 2, lines 57-60 is performed after the drying step.

Accordingly, Applicants respectfully note that Kweon teaches coating a lithiated compound with a (V_2O_5) solution, drying the coated lithiated compound and thereafter heat-treating the dried coated lithiated compound to obtain the positive active material

In other words, Kweon teaches a process of forming a positive active material along the lines of the conventional art illustrated in FIG. 4 of the present application. As noted in the left hand side of FIG. 4, the coated lithiated compound is first dried and after the coated lithiated compound has been dried, the dried coated compound is heat treated in order to form the positive active material. That is, Kweon teaches a two step process for forming a positive active material, first the coated lithiated compound is dried and the dried mixture is heat-treated.

Contrary to Kweon, as illustrated on the right hand side of FIG. 4, the positive active material is formed by a single step process. That is, the heat-treating step is omitted. As noted above, independent claim 11 recites drying the coated lithiated compound at a temperature between 60°C to 100°C forming a surface treatment layer on the coated lithiated compound without heat-treating the dried coated lithiated compound, thereby preparing the positive active material.

Accordingly, Applicants respectfully assert that Kweon fails to teach or suggest at least this novel feature of independent claim 11.

Gao, on the other hand, is relied upon for a teaching of preparing a lithiated compound by mixing a lithium source, a metal source, and a solvent and heat-treating the mixture twice. Gao however, makes no reference or suggestion of forming the positive active material by drying the coated lithiated compound, without heat-treating the dried coated lithiated compound, thereby preparing the positive active material. Accordingly, Gao fails to cure the deficiencies of Kweon.

Finally, the Office Action states that Kweon does not teach that the surface treatment layer on the coated lithiated compound includes a coating element-included hydroxide,

oxyhydroxide, oxycarbonate, hydroxycarbonate or a mixture thereof, and relies on JP '027 (abstract and paragraph [0011]) for such teachings. However, Applicants respectfully note that JP '027 simply discloses providing an enveloping layer on a positive electrode surface, and that the enveloping layer includes an alkali metal salt, an oxide, and a hydroxide. That is, JP '027 at most teaches a hydroxide enveloping layer formed on a surface of a positive electrode. JP '027 however, makes no reference or suggestion of forming this enveloping layer on an active material of a lithiated compound, as recited in independent claim 11. Therefore, even assuming that JP '027 were combinable with Gao and Kweon, Applicants respectfully assert that all the features of independent claim 11 have not been taught.

Claims 22, 23 and 38 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kweon et al. (U.S. Patent 6,183,911) in view of Gao et al. (U.S. Publication 2002/0127175) in view of JP 11-097027 as applied to claims 11-14, 17-20, 24 and 39 above, and further in view of Maegawa et al. (U.S. Patent 6,383,235).

Regarding the rejection of independent claim 38, it is noted that claim 38 recites a method of preparing a positive active material including a core and a surface-treatment layer, for a rechargeable lithium battery, the method comprising: coating the core including at least one lithiated compound, with an organic solution of coating material source, the organic solution excluding water and prepared by adding a coating material source to an organic solvent to form a mixture; and drying the coated core at a temperature between 60°C to 100°C, without heat-treating the core, forming the surface treatment layer on the core, thereby forming the positive active material.

Accordingly, independent claim 38 recites some substantially similar features as claim 11. Thus, the rejection of this claim in view of Kweon, Gao and JP '027 is also traversed for similar reasons as set forth above with respect to independent claim 11.

Maegawa, on the other hand, is relied upon for a teaching of forming a cathode material by spray-drying. Maegawa however, makes no reference or suggestion of drying the coated core, without heat-treating the core, thus forming the surface treatment layer on the core. Therefore, Maegawa fails to cure the deficiencies of Kweon, Gao and JP '027.

Accordingly, Applicants respectfully assert that the rejection of claim 38 under 35 U.S.C. § 103(a) should be withdrawn because neither Kweon, Gao, JP '027, nor Maegawa, whether

taken singly or combined, teach or suggest the novel features of independent claim 38.

Regarding the rejection of claims 22 and 23, it is noted that these claims depend from independent claim 11, and as noted above, neither Kweon, Gao, JP '027, nor Maegawa, whether taken singly or combined, teach or suggest the novel features of independent claim 11.

Accordingly, Applicants respectfully assert that the rejection of dependent claims 22 and 23 under 35 U.S.C. §103(a) should be withdrawn at least because of their dependency from claim 11, and because the dependent claims include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully submitted that claims 22 and 23 also distinguish over the prior art.

Claim 41 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kweon et al. (U.S. Patent 6,183,911) in view of Gao et al. (U.S. Publication 2002/0127175) in view of JP 11-097027 as applied to claims 11-14, 17-20, 24 and 39 above, and further in view of Shindo et al. (U.S. Patent 6,045,947).

Regarding the rejection of independent claim 41, it is noted that claim 41 recites a method of preparing a positive active material for a rechargeable lithium battery comprising: coating at least one lithiated compound having an average diameter of 10 μ m with an organic solution of coating material source, the organic solution excluding water and prepared by adding a coating material source to an organic solvent to form a mixture and to produce a coated lithiated compound; and drying the coated lithiated compound at a temperature between 60°C to 100°C forming a surface treatment layer on the coated lithiated compound without heat-treating the dried coated lithiated compound, thereby forming the positive active material.

Accordingly, independent claim 41 recites some substantially similar features as claim 11. Thus, the rejection of this claim in view of Kweon, Gao and JP '027 is also traversed for similar reasons as set forth above with respect to independent claim 11.

Shindo, on the other hand, is relied upon for a teaching of a particle diameter the lithiated compound.

Shindo however, makes no reference or suggestion of drying the coated lithiated compound without heat-treating the dried coated lithiated compound, thus forming the surface treatment layer on the coated lithiated compound. Therefore, Shindo fails to cure the

deficiencies of Kweon, Gao and JP '027.

Accordingly, Applicants respectfully assert that the rejection of claim 41 under 35 U.S.C. § 103(a) should be withdrawn because neither Kweon, Gao, JP '027, nor Shindo, whether taken singly or combined, teach or suggest the novel features of independent claim 41.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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